

REMARKS

Status of the Application

Claims 1-32 were pending in the present Application.

Claim 1 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-2, 5-15 and 25-32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Obara et al. (US Pat No. 5,661,380) in view of Becerra (Four Quadrant Sensorless Brushless ECM Drive; CH2992-6/91/0000-0202,IEEE). Claims 3 and 4 were rejected under 35 U.S.C. 103(a) as being unpatentable over Obara et al. in view of Becerra and further in view of Balch. Claims 16-20 and 22-24 were rejected under 35 U.S.C. 103(a) as being as being unpatentable over Obara et al. in view of Becerra and further in view of Kumar et al. (US Pat No. 5,992,950). Claim 21 was rejected under 35 U.S.C. 103(a) as being unpatentable over Obara et al. in view of Becerra and further in view of Discenzo (US Pat No. 6,326,758). The Applicant respectfully traverses these rejections.

Claims 1 and 29-32 are amended, leaving claims 1-32 for consideration upon entry of the present amendments. No new matter has been entered.

Claim Amendments

Claims 1 and 29-32 are amended to better recite aspects of the invention. Support for amended claims 1 and 29-32 is found in claims 1 and 29-32 as originally presented and in the specification at least in paragraph [0009] stating, “Therefore, there is a need for a low-cost method to reliably determine the speed of the motor/axle and to thus determine when a locked axle condition occurs in a vehicle **wherein the excitation source is not available.**” (emphasis added)

Claim Rejections Under - 35 USC § 112

Claim 1 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards

as the invention. Specifically, the Examiner stated that the phrase, “traction motor signal is responsive to an operating condition of said traction motor in an electrically unexcited state” does not distinctly and particularly point out the unexcited state to be responded.

Claim 1 is amended to clarify that the traction motor is “electrically unexcited,” i.e., excitation voltage not applied to the traction motor. Paragraph [0008] in the specification provides clarification of when the traction motor is electrically unexcited by reciting, “However there are many operating conditions of a locomotive when an excitation voltage is not available. For example, when the engine is not running, or when the locomotive is in isolated mode such that the alternator cannot produce voltage. Another instance when excitation voltage is not available is when there is a failure or unavailability of the components used in the production of AC voltage to the motor like inverters and power electronics.” (paragraph [0008], lines 1-6)

Accordingly, the Applicant respectfully submits that amended claim 1 particularly points out and distinctly defines the metes and bounds of the subject matter claimed and, thereby, satisfies the criteria of 35 U.S.C. 112, second paragraph.

Claim Rejections Under - 35 USC § 103

Claims 1-2, 5-15 and 25-32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Obara et al. in view of Becerra.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496

(C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Amended claim 1 recites, in part, “A method for detecting a **rotational velocity** of a traction motor in a vehicle comprising: ... obtaining a traction motor signal having at least one phase, wherein said traction motor signal is responsive to an operating condition of said traction motor wherein said **traction motor is electrically unexcited.**” (emphasis added)

As noted by the Examiner, Obara et al. “is silent regarding motor signal is responsive to motor in an electrically unexcited state.”

In contrast to the present invention, Becerra teaches “**rotor position** information can be developed without discrete position sensors by processing motor terminal voltage and/or current waveforms. Electronically-Commutated Motor (ECM) drives using PM [permanent magnet] motors with trapezoidal magnet MMF distributions (also known as brushless DC motor drives) provide attractive candidates for such indirect sensing since only two of the three motor phases are excited at any time instant.” (See Becerra Introduction, second paragraph, emphasis added.) Inherent in having “only two of the three motor phases excited at any time instant” in the brushless DC motor drive is that the motor be excited. The “two of the three motor phases excited at any time instant” require that the motor be electrically excited (i.e., excitation voltage applied to the motor). Nowhere does Becerra disclose or suggest that the brushless DC motor drive is electrically unexcited because “two of the three motor phases are excited at any time instant.”

Also in contrast to the present invention Becerra teaches, “As a result, the back-EMF voltage in the unexcited phase can be conveniently measured to provide the basis for determining ECM inverter instants.” (See Becerra Introduction, second paragraph) That is, Becerra teaches determining **rotor position** for electrical commutation purposes in a brushless DC motor. Becerra does not disclose or suggest detecting a **rotational velocity** in a brushless DC motor.

For at least the above reasons, claim 1 and the claims dependent thereon are novel and patentable over Obara et al. in view of Becerra.

Conclusion

The Applicant has refrained from entering comments regarding certain assertions of the Examiner, and holds these comments in abeyance for purposes of expediency. The Applicant reserves the right to address other assertions of the Examiner, should the arguments and amendments submitted herein be unconvincing.

It is believed that the foregoing remarks fully comply with the Office Action and that the claims herein should now be allowable to the Applicant. Accordingly, reconsideration and allowance is requested.

If a communication with the Applicant's attorney would assist in advancing this case to allowance, the Examiner is invited to contact the undersigned so that any such issues may be resolved.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,
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